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Willingness to Share Supply Chain Data in an Ecosystem Governed Platform – An Interview Study

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Abstract The exchange of business documents and technical product data between the partners of industrial ecosystems can be automated and integrated through digital supply chain (DSC) platforms. The advocates, managers and developers of DSC platforms need to solve several technical and social challenges during the implementation of such platforms. Operative level officers' willingness to share business and technical product data with partner organisations' officers is one of them. This article presents findings from the interviews of 25 sourcing and accounting experts in two industrial ecosystems jointly developing a DSC platform to be governed by industrial ecosystems. The interviewees considered schedule data shareable and detailed design drawings non-shareable. We discovered 12 factors increasing and 9 factors decreasing the willingness to share data. Our study contributes to platform and ecosystem research and offers practical advice to the developers and other stakeholders of the investigated DSC platform.

Keywords: • Governance of data • Digital business ecosystems • Platforms • Data Sharing • Blockchain •

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1 Introduction

With the exception of e-invoices, business documents are exchanged manually between the partners of industrial ecosystems., e.g. an order with related technical product data documents, such as an electric motor specification for a functional location, Ecosystems consist of buyers, suppliers, engineering companies, financiers and other partners. In 2017, the Swiss market research company Billentis (Koch, 2017) disclosed that even for e-invoices the global penetration rate was below 10 % from the global volume of 200 billion B2B invoices. Thus, business documents produced with ERP and other information systems are typically exchanged as excel or pdf files via e-mail, or on paper. The receivers and senders may compare and validate documents manually several times during supply chain processes, e.g. an order against an order confirmation, then transportation documents, an arrival note, and finally an invoice.

Digital supply chain (DSC) platforms are considered as means to automate and integrate the exchange of business and technical product data (Korpela, Hallikas, & Dahlberg, 2017). By doing so DSC platforms are seen to first deliver cost savings (Mikkonen, 2011) and then other benefits, such as agility or new trade finance services, to each member of an ecosystem and to entire ecosystems (Korpela et al., 2017). An earlier study (Korpela, 2014) reported that a 40-company biorefinery industry ecosystem, with 8,5 million business documents and 2,5 million invoices annually, has cost savings potential of 580 million € per year, should 100 % automation rate be achieved.

The development and implementation of a DSC platform with the name DBE Core is the background of the present study. For the DBE concept see e.g. Nachira (2002). Three collaborating industrial ecosystems mandated the establishment of the DBE Core Ltd in 2018 with the objective to develop and implement the DBE Core platform. Individuals representing the focal companies of participating industry ecosystems govern the platform together with the DBE Core Ltd. The use of the platform is offered as a service to the members of these ecosystems and to any other interested enterprise with a pay-as-you go business model. A fourth industry ecosystem joined the platform development in 2019.

The developers of the DBE Core platform have to solve several technical and social challenges during the development and roll-out of the platform. Typically engineering, procurement, logistics and/or accounting executives of the ecosystem companies participate to the governance of the DBE Core platform and guide its development. For example, they agree what data attributes each document (e.g. an order) includes. The agreed contents of documents define data shared between ecosystem partners including data protection and privacy considerations. Executives also act as internal advocates within their enterprises but are seldom operative level users of the platform. Consequently, one of the key social challenges is: are the operative-level officers really willing to share business and technical product data with their peers in other ecosystem enterprises via a DSC platform provided as a service without any platform ownership? We interviewed 25 operative level sourcing and accounting specialists to find the answer. The purpose of our study is to address this research problem, which we also regard a research gap. From this backdrop we formulated the following research questions.

RQ1: What factors increase or decrease the willingness of interviewed operative level experts to share supply chain data with their peers in the investigated platform?
RQ2: What supply chain data are the operative level experts willing to share and not share?

Next, we review the theoretical background of the study followed by a methodology section. We then present interview findings and end the article with a discussion and conclusions section.

2 The Theoretical Background of the Study

De Reuver et al. (2018) claims that platform research lacks conceptual clarity. He therefore advices researchers to clearly define concepts used and to specify the investigated phenomena, their digitality, and other aspects while reporting digital platform research findings. What factors characterize the DBE core as a DSC platform and the industry ecosystems governing that platform? The home page and the presentation materials of the DBE Core Ltd describe the enterprise as a multi-ecosystem platform company that is mandated to develop and operate a multi-sided digital platform in order to automate and integrate the exchange of

business and technical product data between the enterprises of industry ecosystems and between industry ecosystems. The company "*aims to reduce the proportion of manually executed transactions that are characterized by large amounts of non-productive work, errors, waiting time, inflexible financing, insurance and logistics, as well as poor-quality data*" (DBE Core, 2018).

As a multi-sided platform (Hagiu & Wright, 2015) the DBE Core platform allows the members of industry ecosystems to collaborate but also to compete with each other (Corallo, Passiante, & Prencipe, 2007; Iansiti & Levien, 2004a, 2004b). Collaboration builds on jointly agreed documents and document contents, which make their automated exchange possible. On the other hand, each ecosystem partner may develop value-adding services to its (rest API) network end-point. For example, buyers and sellers may integrate their procurement and sales portals to the DBE Core platform and offer value-added information to their business partners in addition to the mere electronic exchange of documents. Engineering, data analytics, finance and other types of service providers may integrate their services to the DBE Core platform as well.

As a DSC platform the DBE Core platform is a technology (hardware, software and network) based solution that integrates and synchronises operations in a rapid, effective, flexible and scalable manner (Büyüközkan & Göçer, 2018). Use of the platform is offered as a service to reduce costs, to improve data quality and to boost innovations. Digital platforms (DSCs) include technological elements that are aligned with organisational processes (de Reuver et al., 2018). The DBE Core platform combines several open source technologies, such as rest API, blockchain and (UN/CFACT and XML) document message technologies. Their combination is used to automate the inter-organizational data exchange of sequential supply chain processes from manufacturing planning (e.g. request a catalogue) through procurement (e.g. order) and logistics (e.g. dispatch advice) to financing (e.g. advice remittance).

The focal biorefinery industry (forest, energy and chemical) companies headquartered in Finland with their major suppliers and the maritime industry with the country's three largest shipyards and their major suppliers constitute the two core industrial ecosystems behind the DBE Core platform. In addition to them major banks and finance industry opted to participate encouraged by platform-enabled trade finance business opportunities. Similarly, IS and IT

technology vendors envision integration and cloud service and engineering companies see technical product data design business opportunities. The development and implementation work started from documents/data used in manufacturing planning and procurement supply chain processes and from the exchange of four technical product data categories. In early 2019, focal companies of the cargo/freight transportation and forwarding ecosystem (air, rail, sea, road) joined the platform development as it proceeded to multimodal logistics processes.

The focal partners of the two industrial ecosystems with their customers and supplier networks are mostly global corporations operating in 100-150 countries. Why do so diverse enterprises and industrial ecosystems collaborate in the development, implementation and governance of the DSC-type DBE Core platform? The potential of significant cost savings and other benefits drive the interests of each company and ecosystem. Large corporations also appear to believe that envisioned benefits are best achievable through (multi-)industry collaboration. The presentation materials of the DBE Core Ltd describe: "*Large companies have developed company proprietary solutions and met the limits of this approach. The conclusion is: it is necessary to agree the content and the form of transactions at ecosystem (=industry) level for inter-organizational data exchange automation to happen*" (DBE Core, 2018). Pilots executed in the biorefinery and maritime industries, that is in process and project industries, proved that similar jointly agreed business documents could be used in both industrial ecosystems. Moreover, the large buyers of these industrial ecosystems are usually the customers of the same global suppliers. Recently, multi-modal logistics pilots have been significant drivers for the investigated platform development. In these pilots, biorefinery cargo and related freight documents have been transported through corridors linking several European Union countries and also cross-EU-border to non-EU countries.

Enterprises execute their digital business strategies (Bharadwaj, El Sawy, Pavlou, & Venkatraman, 2013), which include the sharing of digital assets and digital extensions to supply chains (e.g. Rai, Patnayakuni, & Seth, 2006). The collaborative and multi-dimensional nature of (digital) business ecosystems (Adner, 2017) is also visible in the DBE Core platform and its industrial ecosystems. From the perspective of (future) platform and business ecosystem research it is interesting that the platform, the platform company and several

industrial ecosystems have amalgamated through a platform governance model into a platform-sharing multi-ecosystem entity, where the parts are no longer separated (e.g. Cusumano & Gawer, 2002; Gawer & Cusumano, 2014; Wareham, Fox, & Giner, 2014).

With behavioural willingness to share data we understand the sharing of such proprietary and business critical data between ecosystem partners (through the platform) that creates value to customers/partners (Li & Lin, 2006). According to prior research willingness to share data is impacted by environmental and technological uncertainty, intra-organisational facilitators such as top management support, and inter-organisational relationships such as good relationships between ecosystem partners, trust, shared vision and connectivity (Fawcett, Osterhaus, Magnan, Brau, & McCarter, 2007; Li & Lin, 2006). We reasoned that the governance of data may also influence willingness to share data. Governance of data is currently executed primarily as a single organization practice (Weber, Otto, & Österle, 2009; Weill & Ross, 2005). In an ecosystem, the governance of data is established with transparent rules agreed by ecosystem partners, whose interests may differ. So far, just a few studies have investigated the governance of data in platform contexts and even fewer the governance of data in platform ecosystems (Schreieck, Wiesche, & Krcmar, 2016). Those studies have focused on platform owners' perspective (Lee, Zhu, & Jeffery, 2018) whereas our study focuses on user perspective. Finally, we note that willingness to share data has typically been investigated as a trust issue in prior research. Contrary to this, the technologies deployed in the DBE Core platform build on the assumption that parties do not (need to) trust each other. Blockchain is advocated as a trust technology. Smart contracts, cryptography, public and private keys, distributed ledgers, and consensus in the validation of transactions are applied to provide trust trough technology. Consequently, we did not review behavioural social-psychological trust research for this reason.

3 Methodology

We used the case study research methodology and followed the guidelines of Yin (2014). We selected this research methodology because we wanted to study the phenomenon of data sharing willingness in its real-world context (Yin 2014). We collected data from two technically independent research projects - on the basis of respective industrial ecosystems - and report their results separately. However,

these research projects are interconnected as they have participated to the development of the DBE Core platform. Thus, we regard our article a single case study research as we focus on the willingness of operative level officers to share data through the use of a DSC platform.

We wrote a case study and interview protocol with an interview drama prior to interviews. Half a dozen supply chain professionals and academics evaluated the questions of the final interview instrument to ensure that clear, well defined and easy to understand constructs are used. We tested the interview questions and the drama with two pilot interviews at a shipyard. As no needs for changes we detected we included these interviews into the interview data. For triangulation purposes (Yin, 2014), we used other materials (e.g. research project memos on data sharing) and kept an interview journal, into which the interviewer made notes about the atmosphere of each interview, about interviewee actions and about events during an interview. Connections between interviews were documented as well.

We conducted interviews both in the maritime and the biorefinery industry ecosystem research. The maritime research project has 22 partners. We excluded 10 banks, IS service providers or logistics operators from interviews. The biorefinery project has 26 partners and again we excluded non-industry companies from interviews. The three largest global biorefinery corporations head-quartered in Finland as well as the three largest shipyards operating on global markets are among the partners of these projects. In summary, we contacted all buyer and supplier companies of the two research projects and interviewed all experts that agreed to be interviewed. Some companies, especially in the biorefinery research project, were unwilling to be interviewed due to sensitivity of the subject. We deemed that interviewees had to be limited to the participants of these research projects as the interviewees needed to have at least heard about the aim to automate supply chain data exchange through a DSC platform. The rationale of the platform development was discussed above. A shipyard director described the expected benefits of the platform*: "We do not want to continue the manual checking of electronic invoices against (manual) orders and logistics documents to detect whether or not they match to invoices. Too many of them do not. Supply chain transaction data need to flow automatically all the way from quotations to invoices and payments. Although there is room to improve our internal processes, we cannot achieve alone what we want. We are only able to that together with our suppliers. Since some of them supply*

also our competitors and/or companies in other industries it is necessary to agree at our industry ecosystem level and hopefully also across industries what data and documents are exchanged and how. Close cooperation with the biorefinery industry is warmly welcome for this reason."

In the maritime industry, we interviewed 17 sourcing and accounting experts from 11 companies and in the biorefinery industry 8 experts from 4 companies. The backgrounds and organizational levels of the 25 interviewees varied, although most were sourcing, procurement or accounting managers, or executives in smaller companies. Interviews were carried out between December 2017 and September 2018. The duration of interviews ranged from 35 to 85 minutes. Maritime industry interviews were done by one of the authors and process industry interviews by a master's thesis student supervised by the authors. Two Interviewees were present in one interview but responses were registered separately. Table 1 shows the distribution of the interviewees by industry and between buyer or supplier companies. Selection of the interviewees was based on their position in a partner organisation: we opted to interview persons that actually share commercial and/or technical product data with their partner companies and hence have clear perceptions about potential benefits and challenges. An interviewee was asked to describe her/his evaluations about her/his company's willingness to share supply chain data in general at an organizational level and in details at data attribute level.

Table 1: Numbers of companies and interviewed persons by industries

	Maritime industry	Biorefinery industry
Number of companies	22	26
- buyers	- 4	- 3
- Suppliers (+other)	- 8 (+10)	- 10 (+13)
Number of interviewed persons	17	8
- buyers	- 10	- 7
- suppliers	- 7	- 1

We followed the enhanced interactive (multi-stage) interview method (Dahlberg, Hokkanen, & Newman, 2016) and organized the interview setting as described in details by them. During the interview of 16 semi-structured questions (Myers

& Newman, 2007; Yin, 2014), we followed an incomplete script, which facilitated the placing of additional clarifying questions if needed. This article addresses only interview questions and data on factors promoting/preventing data sharing willingness and perceptions about sharable and non-sharable data attributes.

Displaying interview questions on a screen helped both the interviewee and the interviewer to focus on interview questions. Seeing the typed entry of an answer in real-time on a screen helped the interviewee to correct potential interpretation errors immediately and to "co-create reality" between the interviewee and the interviewer. Interviews were also recorded after asking an interviewee's permission to do that. The listening of the recording immediately after an interview was used to complement the written script into an interview narrative. It was then sent to the interviewee for review and acceptance.

We analysed interview responses question by question, and report here findings to those four interview questions that address our research questions. We started data analysis by reading interview narratives, by identifying primary concepts used in them and by described them. Next, we used the nVivo software to code the interview material and to validate the manually detected primary concepts. Some primary concepts were enhanced, e.g. the final concept "situational factors" was combined from primary concepts "globalisation" and "market situation". Similarly, "technical instructions" was included into "planning materials". The final concepts were abstracted and described from the content of each node. One author created the nVivo concepts and the second author repeated the same to validate nVivo results. Disagreements were discussed until a consensus was reached. The final list of concepts, their frequencies in both industry ecosystems and descriptive quotes are presented in tables 2-5. Methodologically, we regard the analysis and the development of the concepts as the first step in theory building (Eisenhardt, 1989).

4 Results

4.1 Perceptions about Willingness to Share Data

We discovered 12 concepts descriptive for increasing and 9 concepts descriptive for decreasing the willingness to share supply chain data. Tables 2 and 3 disclose the most often mentioned concepts with representative quotes.

Table 2: Factors increasing the willingness to share data through a DSC (the DBE Core) Platform - perceived benefits of supply chain data sharing

Concept	# in maritime	# in biorefinery	Representative quotes from interviewee narratives
Control (of supply chain processes)	10	2	"Control of the entire order could be easier, would a full order message chain be available, e.g. to place additional orders or to change orders." (supplier) "In general, improving the fluency of material flows and order-delivery chains is good." (buyer)
Further development (of supply chain processes)	9	1	"Objective to make physical documents redundant with an electronic portal, managers' desire to share data digitally with reduced efforts." (supplier) "Objective to use fewer e-mails." (buyer) "Business benefits through additional sales, more efficient operations, and better customer service." (supplier)
Resource savings	6	3	"The decrease of manual work, interventions and double-tasking reduce the risk of inferior quality and improve efficiency, productivity." (supplier)

			"The huge number of different standards has created the desire to make data better available through ecosystem collaboration." (supplier)
Data quality	6	0	"Possibility to audit information, traceability, confirmation of correct information." (buyer) "Enhancing quality: meaning both the quality of supply chain communication and data." (buyer)
External pressures	1	4	"We must keep up with our customers." (buyer)

Ability to control supply chain processes was the most frequently mentioned increasing concept. Better availability of data and real-time status information about supply chain processes were also often mentioned. Controlling and developing supply chain processes are similar to the ideas of improving an organisation's operational performance and supply chain partners acting as one entity (Prajogo, Oke, & Olhager, 2016). Prajago et al. underline the importance of long-term relationships as a trust building mechanism between ecosystem members. This research provides supporting evidence. Lack of trust was seen to decrease data sharing willingness, see Table 3. One interviewee suggested that an open multisided DSC platform is a difficult concept, as some ecosystem partners are new. Long-term trust-relationships have not yet developed. We conclude that trust provided by (blockchain) technology appears a novel idea to the interviewees and may need actions to be behaviourally adopted.

Surprisingly, cost savings were mentioned only indirectly as means to replace manual work, improve efficiency or have better access to data. Biorefinery industry interviewees mentioned most often external pressures to share data via a DSC platform. Keeping up with customers described external pressures. The analysis of our interview journal led to the discovery of one concept, situational opportunity, that the nVivo software did not detect. It was vaguely present in five interviews as shown in Table 2. Situational opportunity was described as an unexpected opportunity to further develop inter-organizational supply chain processes whereas further development of supply chain processes was described

as an intra-organizational issue. *"Current global situation and technical development are such that they enable these types of actions (=platform development) and make them sensible."* This quote from one of the maritime industry interviews defined the situational opportunity created by the connections between global markets and global environmental concerns.

Interviewees from both industries mentioned diverse factors similar to prior research (Dinter, 2013; Dreibelbis et al., 2008) that decreased data sharing willingness, such as the poor quality of internal data, the fragmented status of internal ISs and lack of competent resources. Integrations between internal processes and ISs and the DBE Core platform ISs and processes were perceived highly complex. One interviewee explained that his company currently waits and sees how other companies are integrated to the platform and join only after that. Interviewees regarded data sharing a strategic decision with the need to provide executives sufficient amounts of knowledge for decision making. Detailed product data was considered highly sensitive and making data sharing impossible, especially in the maritime industry. Interviewees discussed data protection and other information security issues, such as technology or people risks. Some feared technology related continuity risks others feared viruses, hackers and/or unauthorized access.

Table 3: Factors decreasing the willingness to share data through a DSC (the DBE Core) Platform

Concept	# in maritime	# in biorefinery	Representative quotes from interviewee narratives
Internal factors	8	4	"My company has own old-fashioned ISs." (supplier) "Several internal issues need to solved, such as resourcing, updates to internal processes." (supplier) "This is a strategic decision presuming that executives have sufficient understanding of relevant issues" (buyer) "We have confidential product line data." (buyer)

			"Reliability of internal data is an issue. We do not want to share incorrect information that may cause misunderstandings." (buyer)
Risks	9	1	"Possible interruptions caused by telecom, hackers, data security risks in general." (supplier) "Risk of too detailed product data delivered." (buyer) "Cyber risks, such as information ending up to wrong places and/or persons, other possible vulnerabilities. Viruses from the ecosystem." (buyer)
Trust	9	1	"Too many actors in ecosystems: transporters, suppliers, banks, customers at different levels." (supplier) "In procurement is it possible to strengthen the inner circle through the formation of a shield." (buyer)
Situational factors	5	2	"Market activity is still low, this and next year appear more promising with ISs competing. Time will determine the best ISs/platform and integration options to various ISs/standards." (supplier) "Are there enough benefits to us as compared to inputs needed (depends on the size of the ecosystem and number of transactions in it)." (supplier, buyer)
Costs	2	3	"What is the price tag of such platform and integrations?" (supplier)

Interviewees also wished to see more concrete and measurable benefits. A few interviewees explained that their companies conducted so few business transactions in the two industries that they were unsure about the existence of benefits. The inclusion of value-adding partners, e.g. banks was seen important, as well as the openness of the platform allowing easy entry of new partners. Concerns for expected platform and integration costs were an issue in both industries.

4.2 Perceptions about Sharable and Non-sharable Data

Tables 4 and 5 show what data items the interviewees regarded sharable and non-sharable. We analysed operational-level experts' responses on two levels. Firstly, on company level, that it, what an interviewee believed was her/his company's attitude to data sharing. Secondly, on data attribute/item type level, that is, what data items an interviewee perceived either sharable or non-sharable. Beliefs about companies' attitudes varied greatly. At the other extreme were a few interviewees who claimed that their companies would not like to hide any information from trusted ecosystem partners. Most interviewees, however, described limits to the access rights of data in order to protect business and trade secrets.

Most interviewees perceived planning data sharable via a DSC platform. They wanted to ensure access to standardized data items, measurements and codes. Automatic transmittance of invoices and payments was also widely supported. Ability to carry data from proposals through orders and logistics to invoices and payments is the core of supply chain data exchange automation. This platform functionality was seen to benefit smaller companies but appealed also to larger corporates. Better visibility to partners' schedules facilitated by schedule data sharing was seen as a means to optimize processes and to meet deadlines. This finding is in line with Devaraj et al. (2007) and Prajogo et al. (2016) findings.

A biorefinery industry specific finding mentioned in over the half of the interviews was the willingness to share technical product data instructions and guarantee information through a DSC platform. Due to differences in technical product data and manufacturing, this concept did not appear in maritime interviews.

Most interviewees wanted to protect data about their competitive advantages, capabilities and know-how. They also wanted to ensure that customers were unable to copy and share drawings and innovation data with parties that are able offer similar products and services or to benefit from copied and shared data in other ways.

Table 4: Data attributes perceived sharable

Concept	# in maritime	# in biorefinery	Representative quotes from interviewee narratives
Planning material data	8	1	"It would be beneficial to receive planning and project information through the system." (supplier) "The sharing of drawings and documents is essential to us, since we work with several design suppliers in a geographically wide area. Ability to control design entities is important." (buyer) "PLM data can be easily shared" (buyer)
Invoices and payments	6	2	"Invoicing information automation." (several byers and suppliers) "We want to receive the same invoice data as suppliers to reduce erroneous interpretations." (buyer) "We want to see the link between projects and invoices, e.g. additional / changed orders should be linked automatically to invoices." (buyer)
(Project) schedules	4	2	"There could be a rough schedule related to deliveries and time-tables. Schedules change all the time, and providing exact timetables is not possible. We expect that persons

			viewing a rough schedule understand its meaning." (buyer)
Instructions, guarantees	0	5	"Customer-specific maintenance instructions." (supplier) "Guarantee information." (buyer)
Bilateral information	4	1	"Information necessary to share in bilateral business. We do it already but mediums and formats differ." (supplier) "We only want to share data on a supplier basis on our mutual business transactions." (buyer)

Prices, profit margins and costs were other typical sets of data attributes that interviewees did not want to share. Shipbuilding is a project industry where each ship is unique – and has a unique price. Non-sharable business secret, know-how, detailed project structure and management accounting data were described in multiple ways. Even though interviewees were willing to share planning information and schedules, detailed drawings were non-sharable.

Table 5: Data attributes perceived non-sharable

Concept	# in maritime	# in biorefinery	Representative quotes from interviewee narratives
Competitive advantage	10	5	"Matters that could interrupt normal business should they become known to competitors." (supplier) "Dimensioning, matters related to own empirical knowledge, design know-how." (buyer) "Issues relevant to competitive advantage." (several buyers and suppliers)
Price data	10	2	"For example, pricing information should not to be shared if

			competitors can see it." (several suppliers and buyers)
Internal sensitive data	7	2	"Detailed project structure information." (buyer) "Managerial accounting information." (many buyers and suppliers) "Sums of contracts, terms, payment terms, options, projects' technical details." (buyer)
Business sensitive drawings	6	0	"All information related to products' shape." (buyer) "Information about components, exact manufacturing pictures." (supplier) "Detailed design information of products." (several buyers and suppliers)

5 Discussion and Conclusions

In this study, we interviewed 25 sourcing and accounting specialists. Ability to control supply chain processes increased willingness to share data. We discovered 11 other factors increasing the willingness to share supply chain data and 9 factors that decreased data sharing willingness. Five most frequently factors respectively were shown in Tables 2 and 3. This is our answer to RQ1. We discovered that the interviewees perceived planning materials, invoices and three other data item types sharable as shown in Table 4. Detailed price, competitive advantage, detailed drawings and internal process data reported in Table 5 were considered non-sharable. This is our response to RQ2.

It was a surprise that cost savings was not an important factor for increasing the willingness to share data. Prior research, e.g. Corallo et al. (2007) and Nachira et al. (2007) have reported cost savings as the main driver for ecosystem participation and for the sharing of data between partners, competitors included. Cost savings have also been one of the main benefits that the designers of the

DBE Core platform have promised to deliver. In our study, ability to control supply chain process, to have better quality data and other benefits proved more important. Cost savings had, however, an indirect role in several benefits. This unexpected finding is amenable to future research.

Other findings on factors increasing the willingness to share data are more in line with the findings of prior research in an investigated novel context, where a multi-sided platform and multi-industry ecosystems are amalgamated through the development, implementation and governance of a DSC platform operated by a neutral multi-ecosystem company. Trust and long-term inter-organizational relationships (e.g. in Li & Lin, 2006) as well perceptions about benefits achievable over one's own benefit through cooperation (Iansiti & Levien, 2004b) were detected to increase data sharing willingness similarly to prior studies. Trust delivery through technology instead of human behaviour and cooperation between non-trusting partners appear interesting future research venues.

We found a new factor, situational opportunity, that promotes willingness to share data during the existence of such opportunities. At the time of this study, willingness to try new ISs technologies created such opportunities. Our findings regarding factors that decrease willingness to share data support the findings of prior research.

We regard the present article as the first step to describe theoretically (Eisenhardt, 1989; Santos & Eisenhardt, 2005), how systemic business value (Mikkonen, 2011) is created and divided in multi-industry ecosystems that collaborate by sharing data between industry ecosystem partners and between industry ecosystems via digital platforms. The single case study conducted in one country and in a specific type platform and ecosystem context constitute the main limitations of our study. By repeating interviews in the same industrial ecosystems over time, by interviewing experts from finance, logistics and other industries in several countries and by comparing the DBE Core type platforms to proprietary platforms such as Tradelens could be used to remove the main limitations of this research. Despite of these limitations, we believe our study contributes to platform and ecosystem research. We encourage researches to investigate the automatic exchange of (supply chain) data through platforms in multi-ecosystem and/or multi-modal contexts.

Our study has offered several practical advices to the developers of the DBE Core platform. As a generic advice to practitioners, we encourage them to pay attention to behavioural data sharing concerns and to the governance of data in platforms and ecosystems.

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